Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1 - 19. (Cancelled)

20. (Currently Amended) A ~~The~~ computer implemented process ~~according to claim 19, further~~ comprising:

obtaining a set of one or more private values $Q_1, Q_2, \ldots, Q_m$ and respective public values $G_1, G_2, \ldots, G_m$, each pair of values Q_i, G_i verifying either the equation $G_i \cdot Q_i^v \equiv 1 \bmod n$ or the equation $G_i \equiv Q_i^v \bmod n$, wherein m is an integer greater than or equal to 1, i is an integer between 1 and m, and wherein n is a public integer equal to the product of f private prime factors designated by $p_1, \ldots, p_f$, at least two of these prime factors being different from each other, wherein f is an integer greater than 1, and wherein v is a public exponent such that $v = 2^k$, and wherein k is a security parameter having an integer value greater than 1, and wherein each public value G_i for $i = 1, \ldots, m$ is such that $G_i \equiv g_i^2 \bmod n$, wherein g_i for $i = 1, \ldots, m$) is a base number having an integer value greater than 1 and smaller than each of the prime factors $p_1, \ldots, p_f$, and g_i is a non-quadratic residue of the ring of integers modulo n;

receiving a commitment R from a demonstrator, the commitment R having a value computed such that: $R = r^v \bmod n$, wherein r is an integer randomly chosen by the demonstrator;

choosing m challenges $d_1, d_2, ..., d_m$ randomly;

sending the challenges $d_1, d_2, ..., d_m$ to the demonstrator;

receiving a response D from the demonstrator, the response D having a value computed such that: $\cancel{D = r \times Q_1^{d_1} \times Q_2^{d_2} \times ... \times Q_m^{d_m} \bmod n;}$ $\underline{D = r \bullet Q_1^{d_1} \bullet Q_2^{d_2} \bullet ... \bullet Q_m^{d_m}}$ mod n ;and

determining that the demonstrator is authentic if the response D has a value such that: $\cancel{D^v \times G_1^{\varepsilon_1 d_1} \times G_2^{\varepsilon_2 d_2} \times ... \times G_m^{\varepsilon_m d_m} \bmod n}$ $\underline{D^v \bullet G_1^{\varepsilon_1 d_1} \bullet G_2^{\varepsilon_2 d_2} \bullet ... \bullet G_m^{\varepsilon_m d_m} \bmod n}$ is equal to the commitment R, wherein, for $i = 1, ..., m$, $\varepsilon_i = +1$ in the case $\cancel{G_i \times Q_i^v = 1 \bmod n}$ $\underline{G_i \bullet Q_i^v = 1 \bmod n}$ and $\varepsilon_i = -1$ in the case $G_i = Q_i^v$ mod n.

21. (Currently Amended) A ~~The~~ computer implemented process ~~according to claim 19, further~~ comprising:

obtaining a set of one or more private values $Q_1, Q_2, ..., Q_m$ and respective public values $G_1, G_2, ..., G_m$, each pair of values Q_i, G_i verifying either the equation $G_i \cdot Q_i^v \equiv 1 \bmod n$ or the equation $G_i \equiv Q_i^v \bmod n$, wherein m is an integer greater than or equal to 1, i is an integer between 1 and m, and wherein n is a public integer equal to the product of f private prime factors designated by $p_1, ..., p_f$, at least two of these prime factors being different from each other, wherein f is an integer greater than 1, and wherein v is a public exponent such that $v = 2^k$, and wherein k is a security parameter having an integer value greater than 1, and wherein each public value G_i for $i = 1, ..., m$ is such that $G_i \equiv g_i^2 \bmod n$, wherein g_i for

$i=1,\ldots,m$ is a base number having an integer value greater than 1 and smaller than each of the prime factors $p_1,\ldots,p_f$, and g_i is a non-quadratic residue of the ring of integers modulo n;

receiving a commitment R from a demonstrator, the commitment R having a value computed using the Chinese remainder method from a series of commitment components R_j, the commitment components R_j having a value such that: $R_j = r_j^{\,v} \bmod p_j$ for $j=1,\ldots,f$, wherein $r_1,\ldots,r_f$ is a series of integers randomly chosen by the demonstrator;

choosing m challenges $d_1,d_2,\ldots,d_m$ randomly;

sending the challenges $d_1,d_2,\ldots,d_m$ to the demonstrator;

receiving a response D from the demonstrator, the response D being computed from a series of response components D_j using the Chinese remainder method, the response components D_j having a value such that: $\cancel{D_j = r_j \times Q_{1,j}^{\,d_1} \times Q_{2,j}^{\,d_2} \times \ldots \times Q_{m,j}^{\,d_m} \bmod p_j}$ $D_j = r_j \bullet Q_{1,j}^{\,d_1} \bullet Q_{2,j}^{\,d_2} \bullet \ldots \bullet Q_{m,j}^{\,d_m} \bmod p_j$ for $j=1,\ldots,f$, wherein $Q_{i,j} = Q_i \bmod p_j$ for $i=1,\ldots,m$ and $j=1,\ldots,f$; and

determining that the demonstrator is authentic if the response D has a value such that: $\cancel{D^v \times G_1^{\varepsilon_1 d_1} \times G_2^{\varepsilon_2 d_2} \times \ldots \times G_m^{\varepsilon_m d_m} \bmod n}$ $D^v \bullet G_1^{\varepsilon_1 d_1} \bullet G_2^{\varepsilon_2 d_2} \bullet \ldots \bullet G_m^{\varepsilon_m d_m} \bmod n$ is equal to the commitment R, wherein, for $i=1,\ldots,m$, $\varepsilon_i=+1$ in the case $\cancel{G_i \times Q_i^{\,v} = 1 \bmod n}$ $G_i \bullet Q_i^{\,v} = 1 \bmod n$ and $\varepsilon_i = -1$ in the case $G_i = Q_i^{\,v} \bmod n$.

22. (Currently Amended) A ~~The~~ computer implemented process ~~according to claim 19, further~~ comprising:

obtaining a set of one or more private values $Q_1, Q_2, \ldots, Q_m$ and respective public values $G_1, G_2, \ldots, G_m$, each pair of values Q_i, G_i verifying either the equation $G_i \cdot Q_i^v \equiv 1 \bmod n$ or the equation $G_i \equiv Q_i^v \bmod n$, wherein m is an integer greater than or equal to 1, i is an integer between 1 and m, and wherein n is a public integer equal to the product of f private prime factors designated by $p_1, \ldots, p_f$, at least two of these prime factors being different from each other, wherein f is an integer greater than 1, and wherein v is a public exponent such that $v = 2^k$, and wherein k is a security parameter having an integer value greater than 1, and wherein each public value G_i for $i = 1, \ldots, m$ is such that $G_i \equiv g_i^2 \bmod n$, wherein g_i for $i = 1, \ldots, m$ is a base number having an integer value greater than 1 and smaller than each of the prime factors $p_1, \ldots, p_f$, and g_i is a non-quadratic residue of the ring of integers modulo n;

receiving a token T from a demonstrator, the token T having a value such that $T = h(M, R)$, wherein h is a hash function, M is a message received from the demonstrator, and R is a commitment having a value computed such that: $R = r^v \bmod n$, wherein r is an integer randomly chosen by the demonstrator;

choosing m challenges $d_1, d_2, \ldots, d_m$ randomly;

sending the challenges $d_1, d_2, \ldots, d_m$ to the demonstrator;

receiving a response D from the demonstrator, the response D having a value such that: $\cancel{D = r \times Q_1^{d_1} \times Q_2^{d_2} \times \ldots \times Q_m^{d_m} \bmod n}$; $D = r \bullet Q_1^{d_1} \bullet Q_2^{d_2} \bullet \ldots \bullet Q_m^{d_m} \bmod n$; and

determining that the message M is authentic if the response D has a value such that: $\cancel{h(M, D^v \times G_1^{\varepsilon_1 d_1} \times G_2^{\varepsilon_2 d_2} \times \ldots \times G_m^{\varepsilon_m d_m} \bmod n)}$ $h(M, D^v \bullet G_1^{\varepsilon_1 d_1} \bullet G_2^{\varepsilon_2 d_2} \bullet \ldots \bullet G_m^{\varepsilon_m d_m} \bmod n)$ is equal

to the token T, wherein, for $i = 1,\ldots,m$, $\varepsilon_i = +1$ in the case $\cancel{G_i \times Q_i^v = 1 \bmod n}$ $G_i \bullet Q_i^v = 1 \bmod n$ and $\varepsilon_i = -1$ in the case $G_i = Q_i^v \bmod n$.

23. (Currently Amended) A ~~The~~ computer implemented process ~~according to claim 19, further~~ comprising:

obtaining a set of one or more private values $Q_1, Q_2, \ldots, Q_m$ and respective public values $G_1, G_2, \ldots, G_m$, each pair of values Q_i, G_i verifying either the equation $G_i \cdot Q_i^v \equiv 1 \bmod n$ or the equation $G_i \equiv Q_i^v \bmod n$, wherein m is an integer greater than or equal to 1, i is an integer between 1 and m, and wherein n is a public integer equal to the product of f private prime factors designated by $p_1, \ldots, p_f$, at least two of these prime factors being different from each other, wherein f is an integer greater than 1, and wherein v is a public exponent such that $v = 2^k$, and wherein k is a security parameter having an integer value greater than 1, and wherein each public value G_i for $i = 1,\ldots,m$ is such that $G_i \equiv g_i^2 \bmod n$, wherein g_i for $i = 1,\ldots,m$ is a base number having an integer value greater than 1 and smaller than each of the prime factors $p_1, \ldots, p_f$, and g_i is a non-quadratic residue of the ring of integers modulo n;

receiving a token T from a demonstrator, the token T having a value such that $T = h(M, R)$, wherein h is a hash function, M is a message received from the demonstrator, and R is a commitment having a value computed out of commitment components R_j by using the Chinese remainder method, the commitment components R_j having a value such that: $R_j = r_j^v \bmod p_j$ for $j = 1,\ldots,f$, wherein $r_1,\ldots,r_f$ is a series of integers randomly chosen by the demonstrator;

choosing m challenges $d_1, d_2, \ldots, d_m$ randomly;

sending the challenges $d_1, d_2, \ldots, d_m$ to the demonstrator;

receiving a response D from the demonstrator, the response D being computed from a series of response components D_j using the Chinese remainder method, the response components D_j having a value such that: $\cancel{D_j = r_j \times Q_{1.j}{}^{d_1} \times Q_{2.j}{}^{d_2} \times \ldots \times Q_{m.j}{}^{d_m} \bmod p_j}$ $\underline{D_j = r_j \bullet Q_{1.j}{}^{d_1} \bullet Q_{2.j}{}^{d_2} \bullet \ldots \bullet Q_{m.j}{}^{d_m} \bmod p_j}$ for $j = 1, \ldots, f$, wherein $Q_{i.j} = Q_i \bmod p_j$ for $i = 1, \ldots, m$ and $j = 1, \ldots, f$; and

determining that the message M is authentic if the response D has a value such that: $\cancel{h\left(M, D^v \times G_1^{\varepsilon_1 d_1} \times G_2^{\varepsilon_2 d_2} \times \ldots \times G_m^{\varepsilon_m d_m} \bmod n\right)}$ $\underline{h\left(M, D^v \bullet G_1^{\varepsilon_1 d_1} \bullet G_2^{\varepsilon_2 d_2} \bullet \ldots \bullet G_m^{\varepsilon_m d_m} \bmod n\right)}$ is equal to the token T, wherein, for $i = 1, \ldots, m$, $\varepsilon_i = +1$ in the case $\cancel{G_i \times Q_i^v = 1 \bmod n}$ $\underline{G_i \bullet Q_i^v = 1 \bmod n}$ and $\varepsilon_i = -1$ in the case $G_i = Q_i^v \bmod n$.

24. (Currently Amended) The <u>computer implemented</u> process according to claim 20, wherein the challenges are such that $0 \le d_i \le 2^k - 1$ for $i = 1, \ldots, m$.

25. (Currently Amended) <u>A</u> ~~The~~ computer implemented process ~~according to claim 19, further~~ comprising:

<u>obtaining a set of one or more private values $Q_1, Q_2, \ldots, Q_m$ and respective public values $G_1, G_2, \ldots, G_m$, each pair of values Q_i, G_i verifying either the equation $G_i \cdot Q_i^v \equiv 1 \bmod n$ or the equation $G_i \equiv Q_i^v \bmod n$, wherein m is an integer greater than or equal to 1, i is an integer between 1 and m, and wherein n is a public integer equal to the product of f private prime</u>

factors designated by $p_1,\ldots,p_f$, at least two of these prime factors being different from each other, wherein f is an integer greater than 1, and wherein v is a public exponent such that $v = 2^k$, and wherein k is a security parameter having an integer value greater than 1, and wherein each public value G_i for $i = 1,\ldots,m$ is such that $G_i \equiv g_i^2 \bmod n$, wherein g_i for $i = 1,\ldots,m$ is a base number having an integer value greater than 1 and smaller than each of the prime factors $p_1,\ldots,p_f$, and g_i is a non-quadratic residue of the ring of integers modulo n;

recording a message M to be signed;

choosing m integers r_i randomly, wherein i is an integer between 1 and m;

computing commitments R_i having a value such that: $R_i = r_i^v \bmod n$ for $i = 1,\ldots,m$;

computing a token T having a value such that $T = h(M, R_1, R_2,\ldots,R_m)$, wherein h is a hash function producing a binary train consisting of m bits;

identifying the bits $d_1, d_2,\ldots,d_m$ of the token T; and

computing responses $\cancel{D_i = r_i \times Q_i^{d_i} \bmod n}$ $D_i = r_i \cdot Q_i^{d_i} \bmod n$ for $i = 1,\ldots,m$.

26. (Currently Amended) The ~~process of~~ computer implemented process according to claim 25, further comprising:

collecting the token T and the responses D_i for $i = 1,\ldots,m$; and

determining that the message M is authentic if the response D has a value such that:
$h\left(M, D^v \times G_1^{\varepsilon_1 d_1} \times G_2^{\varepsilon_2 d_2} \times \ldots \times G_m^{\varepsilon_m d_m} \bmod n\right)$

$h\left(M, D_i^{\,v} \cdot G_1^{\varepsilon_1 d_1} \bmod, D_2^{\,v} \cdot G_2^{\varepsilon_2 d_2} \bmod n, \ldots, D_m^{\,v} \cdot G_m^{\varepsilon_m d_m} \bmod n\right)$

is equal to the token T, wherein, for $i = 1,\ldots,m$, $\varepsilon_i = +1$ in the case ~~$G_i \times Q_i^v = 1 \bmod n$~~ $\underline{G_i \cdot Q_i^v = 1 \bmod n}$ and $\varepsilon_i = -1$ in the case $G_i = Q_i^v \bmod n$.

27-28. (Cancelled)

29. (New) The computer implemented process according to claim 21, wherein the challenges are such that $0 \le d_i \le 2^k - 1$ for $i = 1,\ldots,m$.

30. (New) The computer implemented process according to claim 22, wherein the challenges are such that $0 \le d_i \le 2^k - 1$ for $i = 1,\ldots,m$.

31. (New) The computer implemented process according to claim 23, wherein the challenges are such that $0 \le d_i \le 2^k - 1$ for $i = 1,\ldots,m$.

32. (New) A computer readable medium storing instructions which when executed cause a processor to execute the following method:

obtaining a set of one or more private values $Q_1, Q_2, \ldots, Q_m$ and respective public values $G_1, G_2, \ldots, G_m$, each pair of values Q_i, G_i verifying either the equation $G_i \cdot Q_i^v \equiv 1 \bmod n$ or the equation $G_i \equiv Q_i^v \bmod n$, wherein m is an integer greater than or equal to 1, i is an integer between 1 and m, and wherein n is a public integer equal to the product of f private prime factors designated by $p_1, \ldots, p_f$, at least two of these prime factors being different from each other, wherein f is an integer greater than 1, and wherein v is a public exponent such that $v = 2^k$, and wherein k is a security parameter having an integer value greater than 1, and wherein each public value G_i for $i = 1,\ldots,m$ is such that $G_i \equiv g_i^{\,2} \bmod n$, wherein g_i for

$i = 1,\ldots,m$ is a base number having an integer value greater than 1 and smaller than each of the prime factors $p_1,\ldots,p_f$, and g_i is a non-quadratic residue of the ring of integers modulo n;

receiving a commitment R from a demonstrator, the commitment R having a value computed such that: $R = r^v \bmod n$, wherein r is an integer randomly chosen by the demonstrator;

choosing m challenges $d_1, d_2, \ldots, d_m$ randomly;

sending the challenges $d_1, d_2, \ldots, d_m$ to the demonstrator;

receiving a response D from the demonstrator, the response D having a value computed such that: $D = r \cdot Q_1^{d_1} \cdot Q_2^{d_2} \cdot \ldots \cdot Q_m^{d_m} \bmod n$; and

determining that the demonstrator is authentic if the response D has a value such that: $D^v \times G_1^{\varepsilon_1 d_1} \times G_2^{\varepsilon_2 d_2} \times \ldots \times G_m^{\varepsilon_m d_m} \bmod n$ is equal to the commitment R, wherein, for $i = 1,\ldots,m$, $\varepsilon_i = +1$ in the case $G_i \times \cdot Q_i^v = 1 \bmod n$ and $\varepsilon_i = -1$ in the case $G_i = Q_i^v \bmod n$.

33. (New) A computer readable medium storing instructions which when executed cause a processor to execute the following method:

obtaining a set of one or more private values $Q_1, Q_2, \ldots, Q_m$ and respective public values $G_1, G_2, \ldots, G_m$, each pair of values Q_i, G_i verifying either the equation $G_i \cdot Q_i^v \equiv 1 \bmod n$ or the equation $G_i \equiv Q_i^v \bmod n$, wherein m is an integer greater than or equal to 1, i is an integer between 1 and m, and wherein n is a public integer equal to the product of f private prime factors designated by $p_1,\ldots,p_f$, at least two of these prime factors being different from each other, wherein f is an integer greater than 1, and wherein v is a public exponent such that $v = 2^k$, and wherein k is a security parameter having an integer value greater than 1, and

wherein each public value G_i for $i = 1,\ldots,m$ is such that $G_i \equiv g_i^2 \bmod n$, wherein g_i for $i = 1,\ldots,m$ is a base number having an integer value greater than 1 and smaller than each of the prime factors $p_1,\ldots,p_f$, and g_i is a non-quadratic residue of the ring of integers modulo n;

receiving a commitment R from a demonstrator, the commitment R having a value computed using the Chinese remainder method from a series of commitment components R_j, the commitment components R_j having a value such that: $R_j = r_j^v \bmod p_j$ for $j = 1,\ldots,f$, wherein $r_1,\ldots,r_f$ is a series of integers randomly chosen by the demonstrator;

choosing m challenges $d_1, d_2,\ldots,d_m$ randomly;

sending the challenges $d_1, d_2,\ldots,d_m$ to the demonstrator;

receiving a response D from the demonstrator, the response D being computed from a series of response components D_j using the Chinese remainder method, the response components D_j having a value such that: $D_j = r_j \cdot Q_{1,j}^{d_1} \cdot Q_{2,j}^{d_2} \cdot \ldots \cdot Q_{m,j}^{d_m} \bmod p_j$ for $j = 1,\ldots,f$, wherein $Q_{i,j} = Q_i \bmod p_j$ for $i = 1,\ldots,m$ and $j = 1,\ldots,f$; and

determining that the demonstrator is authentic if the response D has a value such that: $D^v \cdot G_1^{\varepsilon_1 d_1} \cdot G_2^{\varepsilon_2 d_2} \cdot \ldots \cdot G_m^{\varepsilon_m d_m} \bmod n$ is equal to the commitment R, wherein, for $i = 1,\ldots,m$, $\varepsilon_i = +1$ in the case $G_i \cdot Q_i^v = 1 \bmod n$ and $\varepsilon_i = -1$ in the case $G_i = Q_i^v \bmod n$.

34. (New) A computer readable medium storing instructions which when executed cause a processor to execute the following method:

obtaining a set of one or more private values $Q_1, Q_2,\ldots,Q_m$ and respective public values $G_1, G_2,\ldots,G_m$, each pair of values Q_i, G_i verifying either the equation $G_i \cdot Q_i^v \equiv 1 \bmod n$ or the

equation $G_i \equiv Q_i^v \bmod n$, wherein m is an integer greater than or equal to 1, i is an integer between 1 and m, and wherein n is a public integer equal to the product of f private prime factors designated by $p_1,...,p_f$, at least two of these prime factors being different from each other, wherein f is an integer greater than 1, and wherein v is a public exponent such that $v = 2^k$, and wherein k is a security parameter having an integer value greater than 1, and wherein each public value G_i for $i = 1,...,m$ is such that $G_i \equiv g_i^2 \bmod n$, wherein g_i for $i = 1,...,m$ is a base number having an integer value greater than 1 and smaller than each of the prime factors $p_1,...,p_f$, and g_i is a non-quadratic residue of the ring of integers modulo n;

receiving a token T from a demonstrator, the token T having a value such that $T = h(M,R)$, wherein h is a hash function, M is a message received from the demonstrator, and R is a commitment having a value computed such that: $R = r^v \bmod n$, wherein r is an integer randomly chosen by the demonstrator;

choosing m challenges $d_1,d_2,...,d_m$ randomly;

sending the challenges $d_1,d_2,...,d_m$ to the demonstrator;

receiving a response D from the demonstrator, the response D having a value such that: $D = r \cdot Q_1^{d_1} Q_2^{d_2} \cdot ... \cdot Q_m^{d_m} \bmod n$; and

determining that the message M is authentic if the response D has a value such that: $h\left(M, D^v \cdot G_1^{\varepsilon_1 d_1} \cdot G_2^{\varepsilon_2 d_2} \cdot ... \cdot G_m^{\varepsilon_m d_m} \bmod n\right)$ is equal to the token T, wherein, for $i = 1,...,m$, $\varepsilon_i = +1$ in the case $G_i \cdot Q_i^v = 1 \bmod n$ and $\varepsilon_i = -1$ in the case $G_i = Q_i^v \bmod n$.

35. (New) A computer readable medium storing instructions which when executed cause a processor to execute the following method:

obtaining a set of one or more private values $Q_1, Q_2, ..., Q_m$ and respective public values $G_1, G_2, ..., G_m$, each pair of values Q_i, G_i verifying either the equation $G_i \cdot Q_i^v \equiv 1 \bmod n$ or the equation $G_i \equiv Q_i^v \bmod n$, wherein m is an integer greater than or equal to 1, i is an integer between 1 and m, and wherein n is a public integer equal to the product of f private prime factors designated by $p_1, ..., p_f$, at least two of these prime factors being different from each other, wherein f is an integer greater than 1, and wherein v is a public exponent such that $v = 2^k$, and wherein k is a security parameter having an integer value greater than 1, and wherein each public value G_i for $i = 1, ..., m$ is such that $G_i \equiv g_i^2 \bmod n$, wherein g_i for $i = 1, ..., m$ is a base number having an integer value greater than 1 and smaller than each of the prime factors $p_1, ..., p_f$, and g_i is a non-quadratic residue of the ring of integers modulo n;

receiving a token T from a demonstrator, the token T having a value such that $T = h(M, R)$, wherein h is a hash function, M is a message received from the demonstrator, and R is a commitment having a value computed out of commitment components R_j by using the Chinese remainder method, the commitment components R_j having a value such that: $R_j = r_j^v \bmod p_j$ for $j = 1, ..., f$, wherein $r_1, ..., r_f$ is a series of integers randomly chosen by the demonstrator;

choosing m challenges $d_1, d_2, ..., d_m$ randomly;

sending the challenges $d_1, d_2, ..., d_m$ to the demonstrator;

receiving a response D from the demonstrator, the response D being computed from a series of response components D_j using the Chinese remainder method, the response

components D_j having a value such that: $D_j = r_j \cdot Q_{1,j}^{d_1} \cdot Q_{2,j}^{d_2} \cdot \ldots \cdot Q_{m,j}^{d_m} \bmod p_j$ for $j = 1,\ldots,f$, wherein $Q_{i,j} = Q_i \bmod p_j$ for $i = 1,\ldots,m$ and $j = 1,\ldots,f$; and

determining that the message M is authentic if the response D has a value such that: $h\left(M, D^v \cdot G_1^{\varepsilon_1 d_1} \cdot G_2^{\varepsilon_2 d_2} \cdot \ldots \cdot G_m^{\varepsilon_m d_m} \bmod n\right)$ is equal to the token T, wherein, for $i = 1,\ldots,m$, $\varepsilon_i = +1$ in the case $G_i \cdot Q_i^v = 1 \bmod n$ and $\varepsilon_i = -1$ in the case $G_i = Q_i^v \bmod n$.

36. (New) The computer readable medium according to claim 32, wherein the challenges are such that $0 \leq d_i \leq 2^k - 1$ for $i = 1,\ldots,m$.

37. (New) The computer readable medium according to claim 33, wherein the challenges are such that $0 \leq d_i \leq 2^k - 1$ for $i = 1,\ldots,m$.

38. (New) The computer readable medium according to claim 34, wherein the challenges are such that $0 \leq d_i \leq 2^k - 1$ for $i = 1,\ldots,m$.

39. (New) The computer readable medium according to claim 35, wherein the challenges are such that $0 \leq d_i \leq 2^k - 1$ for $i = 1,\ldots,m$.

40. (New) A computer readable medium storing instructions which when executed cause a processor to execute the following method:

obtaining a set of one or more private values $Q_1, Q_2, \ldots, Q_m$ and respective public values $G_1, G_2, \ldots, G_m$, each pair of values Q_i, G_i verifying either the equation $G_i \cdot Q_i^v \equiv 1 \bmod n$ or the equation $G_i \equiv Q_i^v \bmod n$, wherein m is an integer greater than or equal to 1, i is an integer between 1 and m, and wherein n is a public integer equal to the product of f private prime factors designated by $p_1, \ldots, p_f$, at least two of these prime factors being different from each

other, wherein f is an integer greater than 1, and wherein v is a public exponent such that $v = 2^k$, and wherein k is a security parameter having an integer value greater than 1, and wherein each public value G_i for $i = 1,...,m$ is such that $G_i \equiv g_i^2 \bmod n$, wherein g_i for $i = 1,...,m$ is a base number having an integer value greater than 1 and smaller than each of the prime factors $p_1,..., p_f$, and g_i is a non-quadratic residue of the ring of integers modulo n;

recording a message M to be signed;

choosing m integers r_i randomly, wherein i is an integer between 1 and m;

computing commitments R_i having a value such that: $R_i = r_i^v \bmod n$ for $i = 1,...,m$;

computing a token T having a value such that $T = h(M, R_1, R_2,..., R_m)$, wherein h is a hash function producing a binary train consisting of m bits;

identifying the bits $d_1, d_2,..., d_m$ of the token T; and

computing responses $D_i = r_i \cdot Q_i^{d_i} \bmod n$ for $i = 1,...,m$.

41. (New) The computer readable medium according to claim 40, the method further comprising:

collecting the token T and the responses D_i for $i = 1,...,m$; and

determining that the message M is authentic if the response D has a value such that: $h\left(M, D^v \cdot G_1^{\varepsilon_1 d_1} \cdot G_2^{\varepsilon_2 d_2} \cdot ... \cdot G_m^{\varepsilon_m d_m} \bmod n\right)$ is equal to the token T, wherein, for $i = 1,...,m$, $\varepsilon_i = +1$ in the case $G_i \cdot Q_i^v = 1 \bmod n$ and $\varepsilon_i = -1$ in the case $G_i = Q_i^v \bmod n$.